

**WHAT IS CLAIMED IS:**

1. A gate driving circuit comprising:
  - a direct current power source;
  - a driving signal source for outputting a high-  
5 level or low-level signal;
  - a main switch device, having a gate terminal in  
which the signal outputted from the driving signal  
source is inputted, for controlling a conduction state  
between a source terminal and a drain terminal in  
10 correspondence with a level of the signal;
  - a load energized when the conduction state  
between the source terminal and the drain terminal  
becomes a conductive state;
  - reverse current blocking means, connected between  
15 the driving signal source and the gate terminal, for  
outputting a signal only in a direction from the  
driving signal source to the gate terminal; and
  - regenerative means, connected between the gate  
terminal and a high potential side of the direct  
20 current power source, which becomes the conductive  
state when the conduction state between the source  
terminal and the drain terminal is a non-conductive  
state,
- wherein a gate-source threshold voltage to obtain  
25 the conductive state between the source terminal and  
the drain terminal is higher than an output voltage of  
the direct current power source.

2. The gate driving circuit according to claim 1,  
wherein the main switch device includes an N-channel  
MOSFET or an N-channel IGBT.

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3. The gate driving circuit according to claim 1,  
wherein the reverse current blocking means includes a  
diode.

10 4. The gate driving circuit according to claim 1,  
wherein the regenerative means includes a MOSFET.

5. A power source circuit comprising:

a gate driving circuit having: a direct current  
15 power source; a driving signal source for outputting a  
high-level or low-level signal; a main switch device,  
having a gate terminal in which the signal outputted  
from the driving signal source is inputted, for  
controlling a conduction state between a source  
20 terminal and a drain terminal in correspondence with a  
level of the signal; a load energized when the  
conduction state between the source terminal and the  
drain terminal becomes a conductive state; reverse  
current blocking means, connected between the driving  
25 signal source and the gate terminal, for outputting a  
signal only in a direction from the driving signal  
source to the gate terminal; and r generative means,

connected between the gate terminal and a high potential side of the direct current power source, which becomes the conductive state when the conduction state between the source terminal and the drain

5 terminal is a non-conductive state,

wherein in the gate driving circuit, a gate-source threshold voltage to obtain the conductive state between the source terminal and the drain terminal is higher than an output voltage of the direct current

10 power source,

and wherein when the conduction state between the source terminal and the drain terminal becomes the conductive state, the output voltage from the direct current power source is supplied to the load.

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6. The power source circuit according to claim 5, wherein the load includes a primary-side coil of a transformer.

20 7. The power source circuit according to claim 5, to perform DC/AC conversion.

8. The power source circuit according to claim 5, wherein the direct current power source includes plural  
25 solar cells which are not serially connected.